NATIONAL TRANSPORTATION SAFETY BOARD
Public Meeting of February 7, 2017
(Information subject to editing)

Westbound BNSF Railway Company (BNSF) train with 112 cars loaded with grain derailed 13 cars while traveling on main track
December 30, 2013

This is a synopsis from the NTSB's accident report and does not include the Board's rationale for the probable cause and safety recommendations. The final accident report and pertinent safety recommendation report will be distributed to recommendation recipients as soon as possible.

Executive Summary

On Monday, December 30, 2013, at 2:10 p.m. central standard time, a westbound BNSF Railway Company (BNSF) train with 112 cars loaded with grain derailed 13 cars while traveling on main track 1 at milepost 28.5 near Casselton, North Dakota.[1] The first car that derailed (the 45th car) fouled the adjacent track, main track 2. At 2:11 p.m. an eastbound BNSF train with 104 tank cars loaded with petroleum crude oil (crude oil), traveling on main track 2, struck the derailed car that was fouling the track and derailed two head-end locomotives, a buffer car, and 20 cars loaded with crude oil.[2] After the collision, about 476,000 gallons of crude oil was released and burned. (See figure 1.) On the day of the accident, the weather was cloudy with a temperature of -1°F and winds from the north at 7 mph. No injuries were reported by residents or either of the train crews. The BNSF reported damages of $13.5 million, not including lading and environmental remediation.

Findings

1. Had the broken axle been subjected to more thorough nondestructive testing when its bearings and wheels were remounted in 2010, the void would likely have been found and the axle would not have been returned to service.

2. Had additional buffer cars, instead of flammable hazardous material tank cars, been placed in positions 2 through 5 of the train, the danger to the train crew would have been significantly reduced and would have allowed for more time for a safe egress from the locomotive.

3. A one-car buffer between the locomotives and the hazardous materials exposes the train crew to unnecessary risk in accidents where cars are derailed closer to the head end of the train.

[1] All times in this brief are central standard time.

[2] The nonplacarded cars between the engine and the placarded cars (carrying hazardous materials) are called *buffer cars*.

4. Without safety justification of the one-car buffer exception, the current regulation for the separation of hazardous materials from occupied locomotives and its interpretation by the FRA, PHMSA, and the railroads create different levels of safety for crew protection from hazardous materials on unit trains and general freight trains.

5. The number and placement of buffer cars should minimize the risk to the crew in occupied equipment.

6. The regulatory interpretation 06-0278 permits the Pipeline and Hazardous Materials Safety Administration, the Federal Railroad Administration, and the railroads to ignore the plain language of 49 *Code of Federal Regulations* 174.85 for unit trains carrying hazardous materials allowing them to operate with only a single nonplacarded car rather than five nonplacarded cars.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of the collision of the oil train with the derailed grain train car was a broken axle on the 45th car of the grain train caused by an internal void that was created during axle manufacture. Contributing to the cause of the derailment were inadequate interchange rules used to locate internal material defects in secondhand-use axles. Contributing to the severity of the accident was the release and pooling of a highly flammable product that resulted in a fire and caused additional cars to fail.

RECOMMENDATIONS

New Recommendations

As a result of this accident, the National Transportation Safety Board (NTSB) issues safety recommendations to the Federal Railroad Administration and the Pipeline and Hazardous Materials Safety Administration.

To the Pipeline and Hazardous Materials Safety Administration:

1. Evaluate the risks posed to train crews by hazardous materials transported by rail, determine the adequate separation distance between hazardous materials cars and locomotives and occupied equipment that ensures the protection of train crews during both normal operations and accident conditions, and collaborate with the Federal Railroad Administration to revise 49 *Code of Federal Regulations* 174.85 to reflect those findings.

2. Pending completion of the risk evaluation and action in accordance with its findings prescribed in Safety Recommendation [1], withdraw regulatory interpretation 06-0278 that pertains to 49 *Code of Federal Regulations* 174.85 for positioning placarded rail cars in a train and require that all trains have a minimum of five nonplacarded cars

between any locomotive or occupied equipment and the nearest placarded car transporting hazardous materials, regardless of train length and consist.

To the Federal Railroad Administration:

3. Evaluate the risks posed to train crews by hazardous materials transported by rail, determine the adequate separation distance between hazardous materials cars and locomotives and occupied equipment that ensures the protection of train crews during both normal operations and accident conditions, and collaborate with the Pipeline and Hazardous Materials Safety Administration to revise 49 *Code of Federal Regulations* 174.85 to reflect those findings.

Previously Issued Recommendations Reclassified in this Report

To the Federal Railroad Administration:

Safety recommendation R-08-12 is reclassified from "Open—Acceptable Response" to "Closed—Unacceptable Action/Superseded," by Safety Recommendation [3] to the FRA:

R-08-12

Assist the Pipeline and Hazardous Materials Safety Administration in its evaluation of the risks posed to train crews by unit trains transporting hazardous materials, determination of the optimum separation requirements between occupied locomotives and hazardous materials cars, and any resulting revision of 49 *Code of Federal Regulations* 174.85.

To the Pipeline and Hazardous Materials Safety Administration:

Safety Recommendation R-08-13 is reclassified from "Open—Acceptable Response" to "Closed—Unacceptable Action/Superseded," by Safety Recommendation [2] to PHMSA:

R-08-13

With the assistance of the Federal Railroad Administration, evaluate the risks posed to train crews by unit trains transporting hazardous materials, determine the optimum separation requirements between occupied locomotives and hazardous materials cars, and revise 49 *Code of Federal Regulations* 174.85 accordingly.

Safety Recommendations R-15-14 and -15 to PHMSA are reclassified from "Open—Acceptable Response" to "Closed—Acceptable Action":

R-15-14 (Urgent)

Require that all new and existing tank cars used to transport all Class 3 flammable liquids be equipped with thermal protection systems that meet or exceed the thermal performance standards outlined in Title 49 *Code of Federal Regulations* 179.18(a) and are appropriately qualified for the tank car configuration and the commodity transported.

R-15-15 (Urgent)

In conjunction with thermal protection systems called for in safety recommendation R-15-14, require that all new and existing tank cars used to transport all Class 3 flammable liquids be equipped with appropriately sized pressure relief devices that allow the release of pressure under fire conditions to ensure thermal performance that meets or exceeds the requirements of Title 49 *Code of Federal Regulations* 179.18(a), and that minimizes the likelihood of energetic thermal ruptures.